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WEAVING PROCESSES IN THE CUZCO AREA OF PERU

ANN POLLARD ROWE

Among the few remaining areas where hand weaving is still done in continuity with ancient traditions, the Andean highlands is surely one of the most interesting. Not only are the textiles themselves often of considerable beauty and complexity, but they also offer a unique perspective, because the tradition behind them is comparatively well known. They can both illuminate and in turn be illuminated by textiles that have survived from pre-Columbian times. These pre-Columbian textiles have been justly acclaimed for their striking designs and technical virtuosity. Yet, for some reason, their modern descendants have never received comparable attention. I visited the Cuzco area of Peru in the fall of 1974 for the purpose of recording what I could about contemporary weaving traditions. The subject has many fascinating aspects, but one which became particularly apparent during my visit was the unexpected diversity of the basic weaving processes used. Previously, only the looms have been described, and rather superficially, as "horizontal ground" (Fig. 1) and "backstrap" (Fig. 2). Yet it is apparent that in principle these looms are the same, while the sets of motions used in operating them seem to constitute more significant differences. Some comments on the principles behind the entire Andean weaving tradition will therefore be presented before proceeding to specifics on the Cuzco area and to the actual weaving processes I was able to observe.

The production of cloths with four selvedges, a significant feature of many indigenous New World textiles, both pre-Columbian and modern, is dependent on the use of a continuous warp. A continuous warp does not necessarily produce a four-selvedge cloth, however. In order to do so, not only must the warp be passed continuously from one loom bar to the other without being cut, but also the initial weft, or heading cord, must be pressed into the turns of the warp to create the end selvedge. It is the heading cord therefore that is lashed against the loom bar rather than the warps themselves. Shedding devices to enable the weaver to raise selected warp yarns in order to pass the weft through must be applied to the completed warp. Such applied devices are also easily removed when the cloth is almost completed to permit the weaving of the entire length of warp. The heddles and shed rod used in most indigenous New World looms fulfill this requirement (See the description and photographs which follow).

These features contrast with the standard European treadle looms, in which warps must be cut in order to be passed through a fixed shedding device (usually a set of harnesses containing permanent heddles) and are then tied to secure them to the loom bars. Such cut ends cannot be used to create a selvedge and, in addition, since the heddle apparatus is a fixed part of the loom, it cannot be removed to permit the last length of warp to be woven. These factors, together with the mechanical tension usually associated with them, facilitate the weaving of yardage rather than four-selvedge cloths.

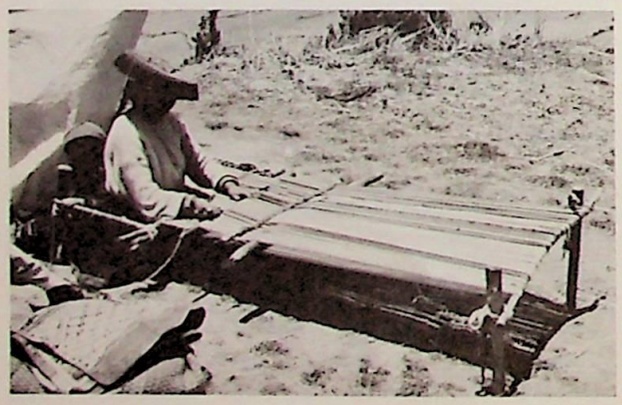

Fig. 1 Loom with four stakes photographed in Qopi (near Q'atqa). The weaver is beating in the weft.

Fig. 2 Loom with backstrap from Chacan. The weaver is picking up the pattern.

The weaving of four-selvedge cloths has in fact been basic to the history of indigenous weaving in the New World in general and to Andean weaving in particular. This weaving principle has conditioned not only the shape of the fabrics, generally rectangular, and thus the garments made from them, but also the choice of weave structures as well as the placement and elaboration of the designs woven. Since each rectangle is set up and woven separately, the tendency has been to insert all the more elaborate patterning by hand (in any of a great variety of techniques) with the shedding devices controlling only the over-one under-one motions of the basic plain weave (or whatever the ground weave happens to be). The treadle loom on the other hand is designed so that a pattern, as well as the ground weave, may be set in the heddles enabling the weaver to raise the proper warp yarns for each part of the pattern in one motion. To produce elaborate patterns the heddle apparatus may be further elaborated, a process resulting ultimately in the draw loom. Often, however, the patterns are confined to what a simpler loom is capable of producing. Treadle looms of whatever degree of elaboration generally produce all-over repeat patterning. The hand manipulations associated with the applied shedding devices of continuous-warp looms on the other hand do not require the patterns to repeat themselves (though the force of tradition and/or the desire for speed of production may counteract this advantage) and enable the designs to be placed on the fabric with a view to its intended use. That is, borders may be woven in and decoration may be concentrated in a particular area which will be prominent on the finished garment.

There are various systems of warping a continuous warp. The most common method is to wind the warp back and forth either in a figure-eight motion or in a ring between the two loom bars and to weave it in a single layer. An alternate method of warping which can also produce four-selvedge fabrics is to dovetail the turns of the warp around a third bar or cord while simply passing around the outside of the other two bars. This latter method of warping has been found in some of the earliest cotton fabrics known from Peru (Bird and Mahler 1951:76) and is also found ethnographically in South America (Hald 1962; Redwood 1973). This dovetail method of warping should be carefully distinguished from another method, in which the warp is wound continuously around two bars in a ring and may be woven to form a tubular fabric, or, if a flat fabric is wanted, the warps must be cut after weaving and the unwoven ends left as fringe. In neither case is a four-selvedge fabric produced, although the warp is indeed continuous and the shedding devices and principles of patterning are usually the same as for a four-selvedge cloth. Similarly, if a continuous warp wound with either of the first two systems remains passing around the loom bar(s) instead of being transferred to a heading cord, a length of unwoven warp must be left as fringe and four selvedges will not be produced, though again the actual weaving process is the same. The loom used in the Cuzco area is warped using the first method, with a heading cord at each end to create the end selvedges.

In much of the literature on indigenous New World weaving, looms of this kind have been described somewhat loosely as "backstrap" or sometimes as "stick" looms. Such names do not reach to the heart of the matter. The backstrap or hip-strap loom is so called because of the way in which tension is applied to the warp, that is, by a belt which is affixed to one end of the loom and which passes around the weaver's hips, so that when he or she leans back the warp is tightened. This manner of putting tension on the warp has nothing to do with the manner in which the warp is attached to the loom bars or with the type of shedding device employed. There are in fact body tension looms equipped with treadles and rigid heddles which do not permit the production of four-selvedge cloths (Roth 1950: Fig. 149, a Malay loom, and Fig. 154A, a Korean loom). The hole and slot type of heddle (ibid.: 112-116) is very often used with body tension, but again, the warps must be cut. This type of heddle is at home in Europe and China (Hommel 1937: 185-6), and where found in the Americas is likely to be a European introduction.

There are in fact other ways of putting tension on a continuous warp. One that is presently very common in the Andean area is to tie each end of the loom bars to stakes driven into the ground. Such looms have generally been described as "four-stake," "staked-out," or "horizontal ground" looms. Actually, the warp attachment and shedding devices of this loom are identical with those of the backstrap loom, which is also found in this area, and the two are used to produce fabrics which are alike in all structural details. Moreover, many Peruvian weavers are familiar with both methods of applying tension to what is in principle the same loom.

For example, in Lauramarka, an agricultural cooperative southeast of Cuzco in the province of Quispicanchis, a woman weaving on a loom with four stakes was asked about the backstrap and she replied that male weavers sometimes used it, but that women did not because it gave them backaches. A male weaver in Q'atqa (also in Quispi-

canchis) when asked about the matter said that he used a backstrap when weaving small fabrics such as the women's shawl, but when weaving larger ones such as ponchos he used four stakes. This differential has some logic since a smaller web would involve less back strain than a larger one. He was at the time weaving a woman's shawl and had the farther loom bar affixed to two stakes, and the other bar to a backstrap (Fig. 5). However, it is also possible to find women operating backstrap looms. Even Lauramarka women will use body tension for weaving if they are away from home and their four stakes are not handy (e.g. Figs. 9-22).

Another method of applying tension to a continuous warp is to affix the loom bars to a wooden frame. Archaeological models and representations of continuous-warp looms with an A-shaped or X-shaped frame have been found on the Peruvian coast. A-frame loom models are known from Chancay (Kidder 1963: 34,36), Marquez (Schmidt 1929: 520, this specimen measures 80 × 21 cm.), and Pachacamac (ibid.: 492, a representation in tapestry). The American Museum of Natural History has a silver Chimu A-frame loom model (Skinner 1975: 72), while the Peabody Museum at Harvard has a fine example of a silver X-frame loom with a Chimu style textile depicted on it (Museum of Fine Arts, Boston 1961: no. 177) and the Textile Museum has a gilded copper model of a simpler X-frame loom, said to be Vicús (1966.59.76, unpublished). East of the Andes, among twentieth century forest tribes, are found also loom frames that are V-shaped (Nordenskiöld 1915: 335, Fig. 130, upsidedown) or elliptical (ibid.: 412, Fig. 193), made with a forked branch, or again U-shaped or ovoid (Farabee 1922: Pl. 16, the so-called Ucayali loom), made with a bent branch. Yet another possible frame is a pair of poles parallel to each other and at right angles to the loom bars, either fixed vertically in the ground (Guaman Poma 1936: 647; Hald 1962; VanStan 1973) or leaned against a wall or other support (Nordenskiöld 1915: 143, Fig. 79, and 177, Fig. 87, Quechua Indians at Incallacta).

Thus, one cannot assume that a pre-Columbian four-selvedge fabric was necessarily produced using a backstrap, but one may with confidence say that it was made on a loom with a continuous warp, heading cord(s) and applied shedding devices.

Such looms may vary in many other ways besides the manner of warping and applying tension, none of which are necessarily significant in the finished product. The shape of the loom bars may vary (flat, with notched ends, or round), the treatment of the surplus length of warp (whether wound up or not, and if so, how), the makeup of the heading cord and the manner of lacing it to the loom bar, the type of looping used for the heddles, the type of tools used for beating in the weft or picking up the pattern, not to mention the variations in the number of heddle rods and the selection of warps they control to create various fabric structures. The motions used in manipulating these loom parts and tools may also vary significantly. In the Cuzco area of Peru during a relatively short period, I observed three completely distinct sequences of motions. These differed in turn from those I have observed in similar looms in highland Guatemala and the montaña area of Peru. Such motions are partly dependent on variables such as the fiber used for the warp (for instance, warp yarns made of a fiber that tends to stick to itself, like wool, require a more abrasive motion to separate them than yarns of a smooth fiber like cotton), the spacing of the warp, the structure of the weave being produced, but they also seem to reflect regional custom, in much the same way that the colors, designs and sizes of the fabrics woven vary regionally.

It is the purpose of this paper to describe as fully as possible the weaving sequences observed in the Cuzco area. In doing so I am following the advice of Junius Bird (1960: 9) to record "all the movements required to complete the passage of the weft yarn for two successive picks or insertions to the left and to the right." I hope this record will underline the interest and value of this kind of observation and encourage others to do similar work in other areas.

THE CUZCO AREA

First, however, since so little has been published on contemporary Cuzco area weaving, some general background information on this subject should be provided. The Indians of the Cuzco area speak Quechua (the Peruvian Spanish spelling of the language name) and are descended from the Incas, Cuzco itself having been the capital of the Inca empire and the center from which it radiated. Rowe (1946: 242) describes the major types of Inca textiles. The finest was called *qompi,* which in all probability corresponds to the fine tapestry-woven cloth that survives from this period. Ordinary cloth was called *'awasqa,* which means simply "woven material." Rowe suggests that this word was used to refer to the plain warp-faced and warp-patterned cloths of the period, and points out that it is this tradition rather than the tapestry which has survived to the present day, the cloth of the ordinary

people rather than the nobility. The warp-pattern weaving tradition of today is, moreover, characterized by considerable variety, elaboration and artistry. It is this warp-pattern weaving which is the subject of the present study.

The fiber most commonly used for cloth in the highlands in Inca times was the hair of the alpaca (a camelid animal domesticated for this purpose), although cotton cloth from the coast was also known. The usually coarser hair of the llama (a camelid used chiefly as a pack animal) and finer hair of the wild vicuña were used to a lesser degree. Alpaca hair is still used to some extent in Andean weaving, although usually in its undyed state. It is found most commonly in solid-colored stripes and as weft. Herds of alpacas are now seldom seen in the lower elevations, but are kept mostly in higher areas where little else will grow. Sheep's wool, introduced by the Spanish, is very widely used. It is often still hand spun though usually dyed with aniline colors (see Goodell 1968). In the last few years fluorescent colored (notably, flaming pink, yellow-orange, and yellow-green) acrylic yarns (*lana syntetica)* have become available and are being used occasionally in the native weaving, to the great detriment of the resulting fabrics.

The Indian costume also blends Inca and Spanish traditions. The skirts and jackets of the women (Figs. 6, 10, 28) and the knee pants and vests of the men (Fig. 5) are derived from the cut of Spanish peasant costume of the colonial period and made of plain-woven wool, either commercially processed or hand spun and hand woven on crude treadle (Spanish-style) looms by male professionals in the community. The local name for the latter product is *bayeta.* The *monteras* or hats worn often by women and in some areas by men as well are also from Spanish prototypes (Figs. 10, 28). Knitting, also a technique of European origin, is used to make men's caps (*ch'ullu*), which are worn under the montera or a more modern type of Western style hat (Fig. 5). The shirts and blouses worn are usually of commercial cotton material, and made up in the towns on treadle sewing machines for sale to Indians. Monteras may be made by local specialists or by the individual. The wool garments, however, seem to be made for individuals only as needed. To these basic garments are added others descended from pre-conquest types and hand woven in warp patterns on a continuous-warp loom. These include belts, called *chumpi,* which are actually worn more for decoration than utility by both men and women, since the women's skirts have waistbands and the men commonly use leather belts to hold up their pants. Other items are bags (*ch'uspa*) for carrying coca and other small items, carrying cloths of various sizes (either called *'unkhuña*, actually an Aymara word, or *q'epirina,* literally "a thing for carrying"), the woman's shawl (*lliklla,* Fig. 28) and the man's *poncho,* apparently a post-Conquest development but woven in the ancient tradition (it seems to be of seventeenth century Araucanian rather than Spanish origin: Montell 1925). The poncho and lliklla are usually made of two four-selvedge lengths (*khallu*) joined by a seam. Fringe for ponchos and edge binding for other items are woven on a separate warp and attached after the larger item is otherwise finished. In the Q'atqa-Lauramarka area, women wear tasselled ribbons (*chaucha*) on their braids (Fig. 12). These ribbons are also hand woven in a traditional manner, as are the bands used as chin straps on monteras. Both the costume as a whole and the style of the warp-patterned items vary regionally. The differences between textiles of two neighboring villages may seem slight, but can usually be pinpointed by the residents. Differences over broader geographic areas are more pronounced, and easier to distinguish. To describe these variations in the Cuzco area alone would take a monograph by itself.

Before proceeding to the weaving process proper, it is worth describing exactly how a continuous warp may be set up. I observed warping in Q'atqa and in Pitumarka, in each case on a loom with four-stake tension. Both of these villages are in the area in which the first sequence of weaving motions to be described is used. Undoubtedly variations in the process exist in other areas not studied to date.

For the warping, two bars are tied about midway up the outside of four stakes in a similar manner as for weaving (Fig. 3). One person sits at each end of the loom behind each warping bar, the weaver and an assistant. The ball of yarn is tossed back and forth between the two, each of whom adjusts the yarn around the bar as to spacing and tension. The weaver has a pile of balls of yarn of various colors beside him and controls the choice and amount of these colors. Since the fabric will be warp-faced, the color scheme and stripe layout is set at this time. Ends of yarn at points of color change are held in place by being brought under previously wound yarns parallel to the bar for the full width of the warp. The warp is passed around the bars in a figure-eight, forming a cross midway between the bars. This process forms the two sheds used in plain weave, alternate yarns coming to the upper surface in front of the cross, and the remaining yarns coming to the upper surface behind the cross. The shed rod is inserted into the shed behind the cross (Fig. 3), and the sword may be inserted

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Fig. 3 Loom with four stakes photographed in Lauramarka. The warping has just been completed and the shed rod inserted behind the cross. Neither the front loom bar nor the heddle rod has been applied.

in front of the cross in the shed which will be controlled by the heddles.

The heddles are often put on before the warp is lashed to the loom bar. To make the heddles, a string is put through the shed (in front of the cross) from right to left, with the ball remaining on the right side of the loom (the point of view described being that of the weaver). The yarn used is often commercial cotton, preferred for its strength and smoothness. The weaver ties the first heddle to size at the left and then begins to make successive heddle loops from the left by picking up the string from between successive warps (all of those on the upper surface of the warp in front of the cross) and winding it around the thumb of his left hand from front to back, holding each loop in place with his forefinger against the thumb so that it does not pull too tight. The weaver puts the heddle rod through the loops when his thumb has as many loops as it will hold. Periodically (about every other fingerfull) he pulls a new length of string from the ball at the right so that the cord is always slack when being looped. This process is continued all the way across the warp. When all the heddle loops are on the stick a cord is tied from one end of the stick over all the loops to the other end of the stick, to keep them from slipping or falling off.

To affix the warp to the front loom bar, the heading cord (which consists of two or three regular weft yarns) is inserted in the heddle shed (in front of the warp cross). The loom bar, a third stick roughly the same as the two used in winding the warp, is placed on top of the warp between the stakes and the heddle rod and the heading cord is tied loosely to each end of this loom bar. With a second cord the weaver lashes the warp and the heading cord to the loom bar in a spiral motion, down between two warps, under the bar and heading cord towards himself and up over the bar away from himself, then down again, moving over four or five warps each time. The heading cord holds the warp yarns against the loom bar. The lashing cord is tied loosely to each end of the loom bar. Next the weaver tightens the spiral lashing, starting at the middle and working towards each end. He does this by pulling each successive loop as tight as it will go, having more and more excess yarn as he goes along. He ties the lashing cord firmly to each end of the loom bar, using a folded over section of the cord to tie to the end of the cord around the loom bar. He unties the ends of the heading cord from the loom bar and ties them together loosely on top of the warp. The warping bar is then lifted up over the stakes away from the weaver and set down on the ground behind them. The loom bar in turn is lifted over the stakes towards the weaver and the warping bar may then be removed. At the completion of this process the ends of the warp yarns which were parallel to the warping bar are adjacent to the heading cord.

With the warping bar removed, the tension slackens and must be tightened. This is done by tying the loom bar low on the front stakes and raising the bar at the other end of the loom to the top of the stakes. The sword is carefully removed with the left point pressing against the heading cord and warp ends. Then the shed rod shed is opened. That is, the cross is brought in front of the heddles, by bringing the shed rod close to the heddle rod and dragging the point of the pick across the warps to separate them. The sword is inserted gradually as the shed is opened and brought forward, thus bringing the cross close to the heading cord. The weaver unties the heading cord and inserts each end into the shed as a second weft. The two ends are long enough so they overlap. One of these is enough longer than the other so that it may be used to

form the third weft as well. The sword is brought as close as possible to the loom bar and the pick beaten across the sword in successive motions over the width of the warp. The sword is again removed with the left end pressed against the heading cord. This beating presses the cross as tightly against the heading cord and warp ends as it will go. When the extra length of the heading cord is used up the weaver winds his shuttle and proceeds with the weaving. The shuttle is a stick about the width of the warp. The yarn is wound on it lengthwise with only a slight rotation and is secured at each end with several turns around the stick crosswise.

When weaving has progressed beyond the weaver's reach, a second stick, sometimes referred to as a "locking bar," the same general size and shape as the loom bar, is placed underneath the weaving just in front of the loom bar and the weaving is rolled onto the two bars. The rolled section is held in place by tying the bar furthest from the weaver either to stakes or to a backstrap, with the cord passing over the other bar (Figs. 1, 4, 12, 20). An alternate method of rolling is to use a flat loom bar with notched ends instead of a round one (Fig. 5, 25). With this kind of loom bar, the finished cloth may be rolled directly on the loom bar without the need of a second bar, and the prong away from the weaver at the end of the bar tied to the backstrap or stakes—which has the same effect as tying to the second bar.

At the opposite end of a four-stake tension loom, the warp yarns pass around the loom bar (which is always round, even if the forward loom bar is flat) as they were during warping. The purpose of this practice is to keep them spread apart to a slightly greater width than that of the cloth actually being woven in order to facilitate the production of straight side selvedges (since the tension of the weft tends to pull the selvedges in). For this reason also, the farther stakes are usually slightly further apart than the front ones. The rear loom bar is usually kept tied directly to the rear stakes, but the arrangement shown in Fig. 4 is also possible. In this case, probably two short lengths of rope, one on each end of the loom, provide more secure tension than one very long rope, if the stakes themselves cannot be brought closer together. Apart from rolling up the finished length of fabric, the tension on four-stake looms must be readjusted periodically to compensate for take-up in the warp, as weft insertion in warp-faced fabrics shortens the warp length.

Only when the cloth is nearly finished does the weaver fasten the far end of the warp to the round loom bar with a heading cord in the same manner as the front one. When this is to be done, the warp is turned around or the weaver reverses his position and works on the unfinished end as if starting over. When enough has been woven (ca. 5-10 cm.) work on the original section may be resumed for the finishing. In the cases actually, observed, in Q'atqa (Fig. 5), Q'atqapampa and the weavers from Lauramarka (in Figs. 9-22), the finishing was proceeding from the original direction and it was apparent for the Q'atqa and Lauramarka weavers that the loom rather than the weaver had been turned. For the last space to be woven a smaller shed rod is substituted for the larger one previously used, and the thumb rather than the whole fist (compare Fig. 9) is used to depress the warp in creating the heddle shed (Fig. 5). Finally the shed rod and heddles must be dis-

Fig. 4 Loom with four stakes photographed in Pitumarka, although the poncho being woven (for sale) is not in the Pitumarka style. Note the attachment to the rear stakes, which is unusual. An empty spindle is lying at the weaver's right.

Fig. 5 Loom with two stakes and backstrap photographed just outside Q'atqa. The weaver has woven the second end of the lliklla and is now using a smaller size shed rod. He is here opening the heddle shed with his thumb. Note also the rectangular notched loom bar.

pensed with entirely and the last wefts put through with large needles. More than one needle may be used at once, one to hold the yarns that have already been picked up, and the other to pick up with (Fig. 6).

This finish area is often done in plain weave and lacks a design because of the difficulty of weaving without a shedding device. For this reason, too, the finish area may be more loosely woven than the rest of the fabric. The color effect is usually mottled as the various colors of patterning yarns are woven side by side and do not float. The quality of the finish is partly dependent upon local custom and partly upon the skill and pride of the weaver. In the Q'atqa-Lauramarka area and in the P'isaq-Calca area fabrics with supplementary warp pattern are often woven in the pattern until the very end, though there is usually a jog in the design where the two ends meet. It is admittedly easier to maintain the pattern to the end with a structure based on plain weave as supplementary warp structures usually are than with more complex structures. In other areas, and with more complex structures, the finish area may be as short as 2 cm. or as long as 10 cm. or more of plain weave. For ponchos and llikllas, the finish areas of the two halves are usually placed on opposite ends of the garment.

Fig. 6 Loom with four stakes photographed in Combapata. The weaver is finishing the weaving with large needles, the heddle and shed rods having been removed. Both ends of the warp are rolled around second sticks.

An alternative to this procedure was found in Combapata (Fig. 6). A woman was weaving both lengths of a poncho on a single warp, and she placed her finish area approximately in the center of the warp. Both ends of the weaving were wound on two bars. If the finish area were placed exactly in the center, it would be possible to cut the warp at this point without finishing it, since the length would have to be cut to be made up in any case. Apparently, weaving both lengths of the poncho on one warp is a shortcut too recently introduced perhaps to have an effect on a centuries-old finishing method. Hemmed ends, indicating the same finishing process, were also observed on many ponchos for sale in Tinta, a town near Combapata where the weaving is similar in pattern structure and design as well. This more rapid process is probably associated with commercialization of the weaving.

The names of the loom parts in Quechua seem to be standard in some cases and to vary considerably in others. Only the relatively standard ones will be listed here, pending further study of the others. The root of the verb to weave is *'awa. 'Awana* means literally "a thing for weaving" but does not seem to be truly equivalent to the English "loom." Perhaps because the parts are not coherent when not in use, no need for a definite word for the whole apparatus is felt. The word for stick is *k'aspi* and is found in combination with other words for some loom parts. Loom bars may thus be referred to as 'awa or 'awana k'aspi (e.g. in P'isaq and Pitumarka) although in some areas a completely different word is used. The word for warp is *'allwi* (also the root of the verb to warp). The warp cross is *q'ata*; there is no term for shed. Weft is *mini*. The word for shuttle usually incorporates mini but seems to vary otherwise. Yarn is *q'aitu*. The heddles are nearly always *'illawa,* and the shed rod *tokoru*. The latter term refers specifically to a kind of cane which is used for this purpose because of its smoothness and lightness in relation to its relatively large diameter. The smoothness is needed so the rod does not abrade the warp and the lightness helps prevent its falling out of the warp, eases the strain of the weight of the loom on a weaver using a backstrap, prevents the warps underneath it from stretching out under a weight, etc. The sword, which is of a hard wood, flat and pointed at both ends, is called either *khallwa* or *ruk'i* while the bone pick is called either *ruk'i* or *wich'una. Wich'u* is a long bone, and usually the pick is made of the leg bone of a llama or alpaca, worked to a point at one end. Ruk'i (for the sword) and wich'una (for the pick) were encountered in the San Pedro de Cacha, Pitumarka and Q'atqa areas. Khallwa (for the sword) and ruk'i (for the pick) were encountered in P'isaq and Chinchiru. Rope is *waskha* and this word is generally used to refer to the braided wool cords used to tie the loom bars to the stakes. The Quechua for loom stakes is

takarpu, but since this word now has impolite connotations at least in some areas (e.g. Pitumarka and San Pedro de Cacha) the Spanish *estaca* is often used instead. The backstrap does not seem to have a Quechua name, but is rather humorously called in Spanish, *baticola* (literally "beat tail"). The large needles used for finishing the weaving are called *yawri*.

Fig. 7 Detail of a poncho from Lauramarka showing the supplementary-warp structure common in Cuzco area weaving. T.M. 1974.16.89. Gift of Junius B. Bird, Marion Stirling, Mary Frances Recher and the Peruvian Research Fund. Photograph by Raymond L. Schwartz.

Pallay is the term used for the warp-patterned bands in the continuous-warp textiles. It means "pick up." The variety of different structures found in these patterned bands is considerable, but for the purposes of this paper only two of the most basic need to be described. The first, which is in fact extremely common in the Cuzco area, is a kind of supplementary warp structure (Emery 1966: 144). In warping for this structure, two ground weave warps are used for each of the supplementary warps. In putting on the heddle, however, alternate yarns are threaded regardless of color: á a ć a á c á a ć a á c á a ć. This results, when the supplementary-warp yarns are floated for the pattern, in the ground yarns being paired (Fig. 7). Thus, although the loom is technically set up to weave plain weave, with single warp yarns, the weaving manipulations produce a cloth which is plain weave with paired warps and with the supplementary warp floating first on one face of the fabric and then on the other. These floats to not conform to any standardized length, but are adjusted to the particular design being woven. Many of the designs consist chiefly of diagonals, which may most easily be rendered by this structure. The preferred designs are usually made up of small elements so that few of the floats exceed five wefts in length. The most common color combination for this technique is white ground warps, red supplementary warps and a black weft. In this case, the warps are not so closely compacted that the weft is completely hidden, but the black shows in the ground weave in small flecks (Fig. 7). In other cases, though, the weft is white and the supplementary warp may be of any of a number of other colors, depending upon the provenience of the textile.

There are two anomalies which may occur in this structure in the process of producing particular design effects. One anomaly is produced when horizontal lines are woven in the supplementary color on the front of the fabric. Alternate pairs of the ground warp float across three wefts on the back along this line. The second anomaly is the floating of ground yarns on the front of the fabric as a patterning device, usually in diagonal lines and next to an area where supplementary-warp floats are dominant (Fig. 7). Such anomalies are obviously achieved by manipulating the pattern weaving entirely by hand, as will be described.

A second common weave structure in the Cuzco area is a simple complementary-warp structure, in which there are two sets of warp, each of a different color, neither of which is subsidiary to the other. For each warp of one color there is one warp of the other color. Each set maintains an over-three under-one order of interlacing, one set having its three-span floats on one face of the fabric and the other set having its three-span floats on the opposite face. The three-span floats on each face are in alternate alignment (Emery 1966: 150-152, fig. 244-245) or may be aligned in alternate pairs. The under-one interlacing of one face is placed in the center of the three-span float of the opposite face, so that when the fabric is strongly warp-faced, as these examples are, a different solid color is produced on each face. The two sets (colors) are interchanged to create the pattern (see Fig. 8).

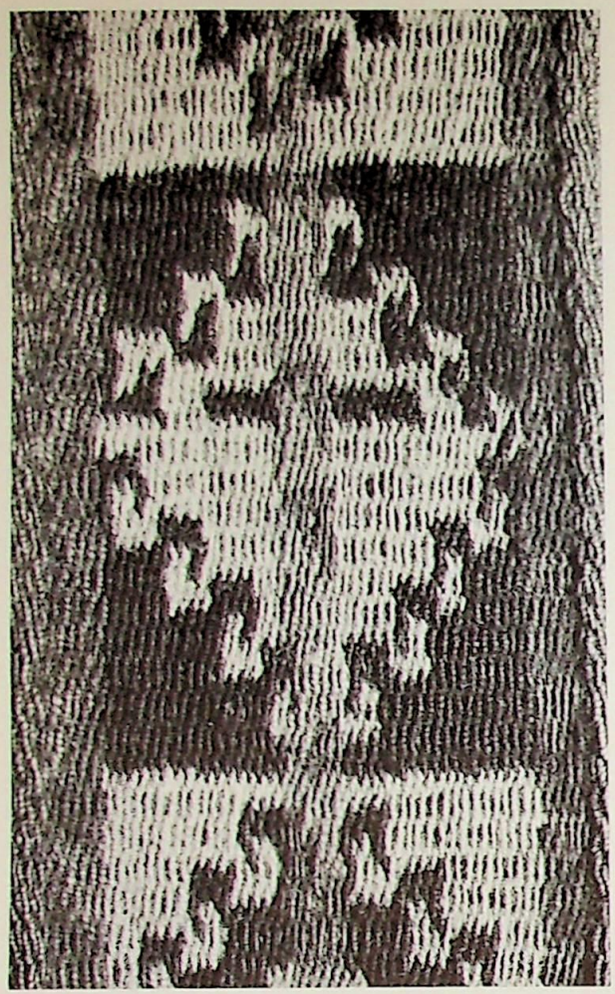

Fig. 8 Detail of a belt from the hacienda of Chahuaytire (similar belts are also used in Colquepata), woven in 3/1 complementary warp in alternating alignment. T.M. 1974.16.133. Gift of Junius B. Bird, Marion Stirling, Mary Frances Recher and the Peruvian Research Fund. Photograph by Raymond L. Schwartz.

In the Cuzco area this structure is produced by warping the two colors alternately, and applying the heddles to one set of warps and allowing the shed rod to control the other. This procedure was actually observed in Chinchiru, San Pedro de Cacha and Pitumarka. The use of two additional heddle rods facilitates the weaving of this structure, but a complex pattern would require so much hand manipulation anyway that this advantage might be cancelled out. Thus although the warp is again set up technically to produce plain weave, a compound structure results from picking up the pattern by hand. A single, continuous weft is used.

In fact, these two structures, supplementary warp with paired warp ground, and 3/1 complementary warp in alternating alignment, can be woven using closely similar motions. The variations in motion to be described here are thus not based on structure or any other tangible variable.

WEAVING SEQUENCES

Figures 9-22 illustrate one of these sequences of weaving motions, in this case for supplementary-warp patterning. Two different women weavers are shown, both from Lauramarka. They are weaving ponchos for sale to Cuzco dealers. These ponchos are larger in size and considerably coarser in weave than the ponchos actually worn by Lauramarka men, but the technique of weaving them, as well as the general layout and design, is of course the same. They say it takes one month to weave such a poncho. Although four stakes are customarily used to maintain tension by Lauramarka weavers, these women have improvised backstraps from lengths of braided rope. A single length of rope is placed about the hips, around each end of the front loom bar furthest from the weaver and then brought back and tied behind the hips.

To create the shed controlled by the heddle rod, the weaver has removed the sword from the loom and pushed the shed rod towards the back of the loom. She then lifts the heddle rod with her left hand and with her right hand in a fist, punches the warp down behind the heddle rod in successive punches from right to left all the way across (Fig. 9). Still holding the heddle rod in her left hand, she inserts the sword with her right hand from the right, slightly behind the heddles (Fig. 10). She then brings the sword part way forward (Fig. 11) and the shed rod is returned to its position next to the heddle rod. The warps passing over the farther loom bar may be readjusted at this point (Fig. 12).

To further separate the warps and bring the cross forward, she drags the tip of her pick across the warp in a scraping motion several times, first behind the sword (Fig. 13) and then in front. The sword may then be brought close to the woven edge very sharply once or twice (Fig. 14). The sword is next held closely against the woven edge with the left hand and the pick, held sideways in the right hand, is inserted under the upper layer of warps and brought down sharply across the sword against the woven area (Fig. 15), a motion repeated rapidly at short intervals across the width of the loom, compacting the cross and previous weft. This entire beating motion may be repeated a second time.

Fig. 9 Lauramarka weaving sequence. Punching down the warp to open the heddle shed.

Fig. 12 Adjusting the spacing of the warps over the rear loom bar. Lauramarka. The tassels at her waist are attached to the ends of her braids (worn under her jacket).

Fig. 10 Inserting the sword into the heddle shed. Lauramarka.

Fig. 13 Dragging the pick across the warp. Lauramarka.

Fig. 11 Bringing the sword forward in the heddle shed. Lauramarka.

Fig. 14 Bringing the sword forward to beat. Lauramarka.

The sword is then moved back towards the heddle rod and is set on edge. The picking up of the desired pattern yarns is thus done with the shed open. Pick-up may be done either with the bone pick or with a separate wooden pick-up stick (Fig. 16). This seems to be an individual rather than a regional preference. One of the two Lauramarka women was using a bone pick and the other a wooden pick-up stick. Either is held in the right hand near the point, with the four fingers wrapped around it (palm down) and the thumb resting near the point. The pick-up is done right to left. The weaver holds the warp yarns to the left of the point of the pick-up stick with her thumb and middle finger of the left hand and pulls them further away if a pattern yarn is to be picked up from the lower shed, simultaneously pushing the warp yarns on the right to the right with her first finger (Fig. 16). In the pick-up for the supplementary-warp structure the ground yarns are ignored as they are adequately controlled by the heddle and shed rods,

Fig. 15 Beating with the pick across the sword. Lauramarka.

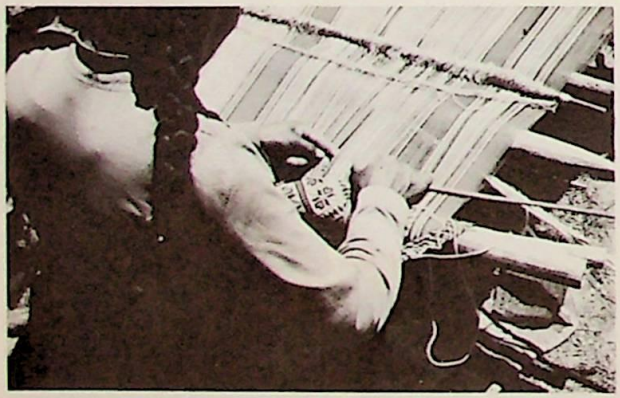

Fig. 16 Picking up the pattern, using a wooden pick-up stick. The shuttle is inserted to hold the completed pick-up. Lauramarka.

but a decision must be made for each of the supplementary yarns, in both sheds, as to whether it will be on the surface to create the pattern or not. Supplementary yarns in the upper shed not wanted for the pattern must be dropped. As the pick-up for each pattern stripe is completed, the shuttle is inserted in the new shed. When all of the pick-up is completed the shuttle is drawn through the shed (Fig. 17) to the other side of the loom (right to left) leaving a length of weft behind. The weft is positioned in the shed and at the selvedge so that it will lie smoothly and the sword is removed.

Then the shed is changed to bring up those yarns passing over the shed rod. This is done by holding the shed rod next to the heddle rod and dragging the point of the pick across the warps in front of and in back of the two rods several times (Fig. 18). Often in addition the pick is inserted under groups of warps to be raised just in front of the heddle rod and is brought forward towards the woven area (Fig. 19). Another motion sometimes used is to insert the pick (held slanting) under the upper level of warps from above, pulling aside adjacent warps in the upper level in back of the shed rod and to scrape it across the lower level of warps, at intervals across the width of the warp. The pick-up is then done as before only the sword is inserted from the right as the pick-up is completed in each band (Fig. 20). The cross and the previous weft are beaten down as before, with the sword brought forward and the pick beaten across it (Fig. 21). The weft is inserted left to right (Fig. 22). The process may then begin anew.

There are of course some individual variations to this procedure and a weaver may vary her own motions to some extent. For instance, I saw a weaver from Colquepata (in the province of Paucartambo) who did her beating before instead of after the pick-up in the shed rod shed. In addition, for both sheds the sword was in the shed during pick-up and the shuttle was inserted as pick-up was completed. Another variation was to bring the sword forward sharply against the weft immediately after it had been inserted before changing sheds. The motion of inserting the pick under groups of warps passing over the sword and pulling the pick forward was done in opening the heddle as well as the shed rod shed. A weaver in Checacupe who was weaving a poncho without any pattern stripes used a similar motion with her sword, inserting it a third of the way across and pulling it forward, then two-thirds of the way and forward, then all the way and forward, then beating. The weaver in Q'atqa shown in Fig. 5 left his pick-up stick in the shed as the pick-up was completed.

Fig. 17 The shuttle is passed through the heddle shed after pick-up to insert the weft. Lauramarka. Photograph courtesy of Linda S. Robinson.

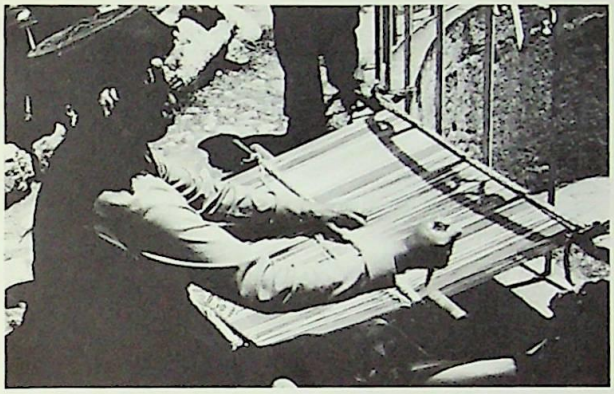

Fig. 18 Dragging the pick across the warp to open the shed rod shed. Lauramarka.

Fig. 19 Inserting the pick under the warps in the shed rod shed to open the shed. Lauramarka.

Fig. 20 Picking up the pattern in the shed rod shed. The sword is inserted to hold the completed pick-up. Lauramarka.

Fig. 21 Beating with the pick across the sword in the shed rod shed. Lauramarka.

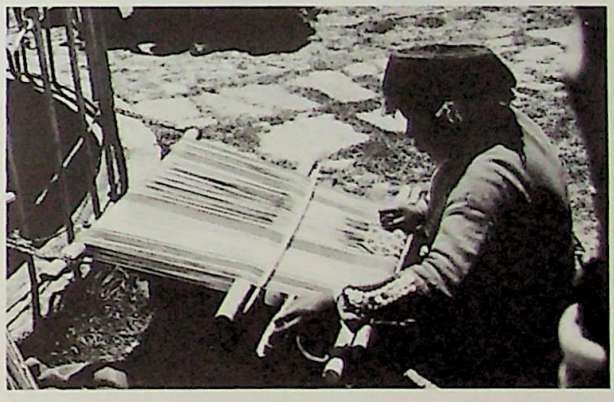

Fig. 22 Inserting the weft in the shed rod shed. Lauramarka.

The general procedures are, however, basically the same. Besides the above mentioned places, weavers using this process were observed in Pitumarka and San Pedro de Cacha. The San Pedro weaver and one of those in Pitumarka were weaving complementary-warp pattern instead of supplementary-warp. The San Pedro weaver was working with very narrow pattern stripes, eight

warps wide, and was making a simple x and o design. The pick-up was done after opening the shed rod shed, and it was not necessary to pick up again after making the heddle shed. The rest of the process was the same as that described for the Lauramarka weavers above.

It would seem that this method is in general use in the area east of Cuzco between Urcos and Lauramarka in the province of Quispicanchis and at least some parts of the province of Paucartambo. It is also found south of Cuzco between Urcos and Sicuani in the province of Canchis. The area around Quiquijana, however, was not investigated nor were neighboring provinces such as Acomayo. It would seem also that in this area the four stake method of holding tension is preferred although the backstrap is certainly known. The weaving motions are the same for either set-up.

A second set of weaving motions was observed in use by a weaver from Chacan, in Anta, west of Cuzco (Figs. 2, 23-25). This man was weaving a poncho for sale with supplementary-warp pattern using a backstrap loom. His backstrap had been woven of coarse yarns specifically for this purpose. Also, oddly enough, he was seated in a chair instead of on the ground and braced his feet against some large rocks to increase the tension.

His loom differed in other respects from those just discussed. At the front of the loom he had a flat notched loom bar so that the completed weaving could be rolled directly onto it without the need for a second bar. At the other end of the loom, the warp did not pass around the bar but had a heading cord laced to the loom bar as at the woven end. This feature seems to be characteristic of looms with backstrap as opposed to four-stake tension, though the hybrids confuse the issue. Similarly, the heddles did not pass over the heddle rod but were laced to it in the same manner as the warp was to the loom bar. Since the warp was laced to the loom bar at the far end instead of passing around it, a lease cord was put through the shed rod shed behind the shed rod to keep the place should the shed rod fall out accidently. The chief differences in weaving motions were due to the use of three swords instead of one. In addition a wooden tool which combined the functions of pick and pick-up stick was used. It was about the width of the weaving in length and pointed at one end. It was also slightly curved, whether from intention or carelessness is uncertain.

In this weaving process two of the three swords are inserted in the warp at all times, in alternate sheds. In changing sheds, the third sword is inserted behind these two. To change the shed using the heddle rod, the weaver stands up

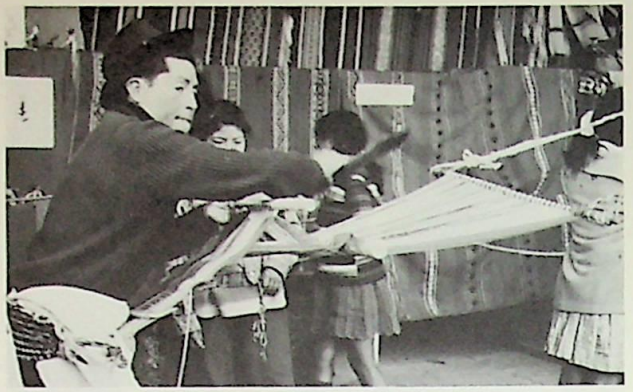

Fig. 23 Chacan weaving sequence. Beginning the motion of opening the heddle shed.

and bends forward slightly to slacken the tension and extend his reach, puts the unused sword behind the shed rod with the right hand (Fig. 23), grasps both sword and shed rod together, with fingers over it (palm down) and thumb underneath, and rolls them slightly away from him, meanwhile pulling up the heddle rod with the left hand. This produces a large triangular shed opening. He then releases the shed rod and, still holding the sword in this right hand, inserts it into the shed under the heddle rod, usually while still standing.

He sits down again and brings this sword forward against the other two, so that all three are adjacent to each other and to the woven area. The point of the pick is dragged across the warp between the swords. The sword nearest the woven area is turned on edge, and the point of the pick is used to beat against the woven area between the warps. A rapid, slightly curving motion is used successively from left to right across the warp. Then the sword nearest the weaving (that was turned on edge) is removed. The adjacent sword is brought forward sharply against the woven area, and pushed back again.

The weaver now commences to pick up the pattern (Fig. 24). The pick is held near its blunt end with the palm up. It is gradually inserted into the (heddle) shed from the right side, as the pick-up proceeds from right to left. The left hand manipulates the warp for the pick-up. After the pick-up is complete, the pick is left in the shed thus created and is pressed back against the nearest sword. The shuttle is put through the shed and the pick removed. The nearest sword is brought forward sharply against the weft, and the second sword is brought forward against the first one.

A new shed (the shed rod shed) is then made in back of these two swords. For the shed rod

Fig. 24 Picking up the pattern. Chacan.

Fig. 25 Opening the shed rod shed. Chacan.

shed, the weaver drags the tip of the pick across the warp between the shed rod and heddle rod (Fig. 25). The shed rod is brought forward next to the heddle rod. The tip of the pick may be dragged across the warp in front of the heddle rod several times, unless the motion of bringing the shed rod up against the heddles is sufficient to open the shed. The third sword is inserted into the new shed and brought up close to the other two. Beating, picking up the pattern, inserting the weft and positioning of the two swords proceed as before and the process beginning with making the heddle shed is repeated.

I unfortunately did not have the opportunity of travelling in the Anta area to pinpoint directly the distribution of this weaving method. However, it would be difficult in any case, since little weaving is now being done there and the native costume is not much worn any more. The weaving being done by the man described was very garish and seemed the last vestige of a once richer tradition. However, aside from the chair, the method is undoubtedly aboriginal and certainly not unique to this weaver.

The American Museum of Natural History has a loom (40.1/2303) from Huarocondo, also in Anta, that had originally five swords (it now has four). It is also a backstrap loom, with a leather backstrap, and has flat notched loom bars. In this case, the weaver to whom it had belonged was a woman. The far end of the warp is secured to the loom bar in the same manner as in the Chacan loom, although the heddles are not - they are made in the same way as in the looms previously discussed. No pick or pick-up stick is preserved with the loom, but Junius Bird recorded that a sword was inserted in the shed as the pick-up was completed and then turned on edge for the insertion of the weft. This kind of variation was found in the first weaving process described and does not preclude the idea that the remainder of the process might have been very similar to that described for the Chacan weaver. The weave structure in the pattern stripes of the Huarocondo loom is not supplementary-warp but rather a peculiar combination of complementary warp and plain weave. As on the Chacan loom the colors of the yarns are very garish. The loom was collected in 1961.

A second method of using multiple swords was observed in Chinchiru (Sp. Chinchero), northwest of Cuzco (Figs. 26-30). Many Chinchiru women weave belts for sale, in both supplementary-warp and complementary-warp techniques, although the local style is for complementary-warp patterned belts. It was the belt weaving I actually observed, although the weaving on wider looms follows generally the same process. On the belt looms body tension is used, although there is no backstrap in the usual sense. One end of the warp is looped around a large nail stuck into the ground (Fig. 27). The weaver ties a cord around her waist and, if the belt is already partially woven, the woven end of the belt is passed behind the cord, top to bottom. The areas of the belt just above and below this cord are pinned together with a large needle (Fig. 29). This way of applying tension to a narrow band is probably widespread. I observed two weavers from the Q'atqa area using the same method, only one of them had the end of the warp hooked around her toe instead of a nail.

Another characteristic of looms for weaving narrow bands is that the heddles and shed rod may be of yarn only, with no stick attached. In the Chinchiru belt looms, the function of the shed rod is taken by a loop of yarn passed through the shed like a lease cord. The heddle rod however is a stick

and the heddles are laced to the stick in the same manner as on the Chacan loom.

The Chinchiru weavers use anywhere from two to five swords. When asked about the reasons for using five swords as opposed to two, one weaver said that a finer and more precise design could be obtained with multiple swords, and another said that the work went faster that way. In practice, this method allows the weaver to do pick-up for several shots of weft one after another without being distracted by the other motions. This may speed the process to some extent, though a skilled weaver accustomed to weaving particular designs can weave without hesitation by other methods. It may also help keep the tension even.

In Chinchiru weaving, first all the swords are inserted, in alternate sheds. The shed cord shed is opened by grasping the shed cord and bringing it towards the heddles. A sword is inserted in the shed behind the heddle rod and the fingers of both hands hold it upright against the heddle rod while the thumbs at the same time brush the warp in front of the heddles, from the center to the side edges to move the cross forward (Fig. 26). The sword is then inserted in the shed cord shed in front of the heddle rod and brought forward next to the woven area. The heddle shed is opened by grasping the heddle rod with the left hand and pulling it up, at the same time leaning forward to release the tension on the warp. At the same time also, the shed cord and the yarns passing through it are grasped in the right hand and pulled away from the weaving (Fig. 27). The second sword is inserted in this shed and brought forward next to the preceding. The remainder of the swords are inserted in the same manner.

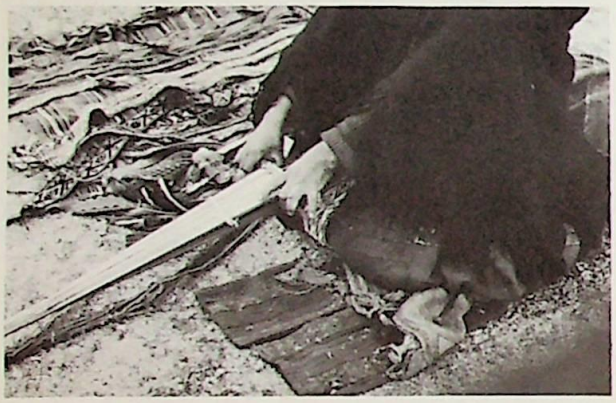

Fig. 26 Chinchiru weaving sequence. Opening the shed rod shed.

Fig. 27 Opening the heddle shed. Chinchiru.

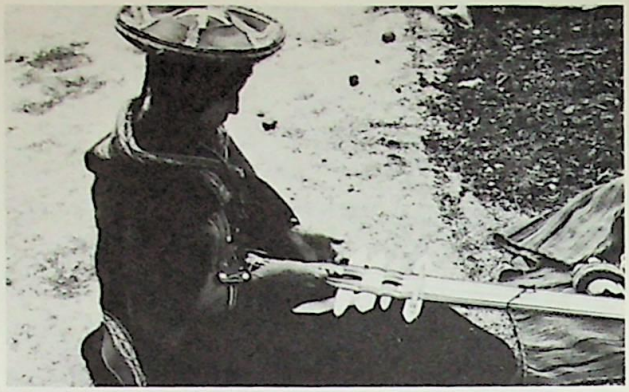

Fig. 28 Picking up the pattern. This weaver is wearing the traditional Chinchiru costume.

Then all the swords are moved back towards the heddle rod starting with the last one that was inserted. This clears a space between the edge of the weaving and the nearest sword. Next, the nearest sword is removed and the fingers inserted in this shed from both sides of the loom. The pick-up is done entirely with the fingers (Fig. 28). The yarns to be picked up from the shed opposite to the one actually opened are obtained easily since they pass over the sword in the next shed. The sword is then re-inserted into the shed formed by the pick-up and brought close to the woven area. The second sword is removed and the pick-up is made in that shed behind the first one. On completion of the pick-up the sword is re-inserted and brought forward as before. This is repeated for all the swords in use.

Then all the swords are moved back towards the heddle rod again. The sword nearest the woven area is turned on edge and the weft inserted (Fig. 29). That sword is removed and the second one brought forward. It is pressed so hard against the woven area - with the inside of the fingers against

Fig. 29 Inserting the weft. Chinchiru.

Fig. 30 Beating in the weft. Chinchiru.

the back edge on each end - that the back edge of the sword is raised and then allowed to snap back (Fig. 30). This motion is repeated several times rapidly and takes the place of beating with a pick. The sword is turned on edge, the weft is inserted, and the sword is removed. The next sword is brought forward and the process is repeated until all the swords have been removed. The whole process then begins again.

An alternative procedure, which was also observed in Chinchiru, was to combine the pick-up with weft insertion. The sword which has been reinserted into the shed formed by the pick-up is turned on edge and the weft inserted. This sword is then removed and the second one brought forward and beaten against the woven area. The second one is then removed and the fingers inserted into the shed for the pick-up. The work continues in this fashion until all the swords have been removed. The weaver shown in Figs. 26-27 and 29-30 was using this method. The weaver shown in Fig. 28 was using the first method.

There are thus at least three completely different ways of operating the continuous-warp loom as found in the Cuzco area. Some variation in such a small geographic area may be expected, but the degree of variation recorded here is indeed astonishing. Such divergence in the way a basic technology like weaving is effected is probably of greater significance than even the variations found in the style and designs of the textiles which result. It is obvious that description of the loom itself is only a small part of the total weaving complex of this area, and that a false sense of uniformity in the tradition is obtained if description is so confined. The data presented here are admittedly incomplete in terms of the number of towns visited and the number of weavers observed and recorded. A more comprehensive survey along the lines suggested here would undoubtedly prove worthwhile, and would be a necessary prelude to an attempt to determine the cultural significance of these variations. It is possible that the source of these differences lies in the pre-Columbian past. Weaving is probably the most complex aboriginal craft technology still surviving in the Andean highlands, and could tell us much about both the present and the past if it were studied carefully enough.

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